

WE CLAIM

1. A method for outlining an energy zone on a surface whose temperature is to be measured using a radiometer, said method comprising the steps of providing a laser device associated with said radiometer, and causing said device to emit a plurality of at least three laser beams towards said surface to strike said surface at individual mutually spaced locations serving at least to outline said entire energy zone.

2. The method of claim 1, wherein said method further comprises the steps of causing said sighting device to project a laser beam towards said surface, and subdividing said laser beam with a beam splitter means to provide said more than two of laser beams.

3. A method for outlining an energy zone on a surface whose temperature is to be measured using a radiometer, said method comprising the steps of providing a laser device associated with said radiometer, causing said laser device to emit at least one laser beam, passing said at least one laser beam across a diffraction grating to subdivide said beam into a plurality of at least three laser beams, and directing said plurality of at least three laser beams towards said surface at individual mutually spaced locations serving at least to outline said energy zone.

4. Apparatus, for use in conjunction with a radiometer, for outlining an energy zone on a surface whose temperature is to be measured using said radiometer and means for emitting a plurality of at least three laser beams to strike said surface at individually spaced apart locations serving to outline said energy zone.

5. The apparatus of claim 4 including a sighting device and a beam splitter diffraction means, and wherein said sighting device projects at least one primary laser beam towards said surface, and wherein beam splitter means are disposed between said device and said surface to be struck by said at least one primary laser beam and to subdivide said at least one primary laser beam into a plurality of secondary laser beams.

6. Apparatus, for use in conjunction with a radiometer, for outlining an energy zone on a surface whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device co-operating with said radiometer, said sighting device projecting at least one primary laser beam towards said surface, and a diffraction grating disposed between said device and said surface to be struck by said at least one primary laser beam and to subdivide said laser beam into a plurality of at least three secondary laser beams to strike said entire surface at individually spaced apart locations serving to outline said entire energy zone.

7. The apparatus of claim 4 in combination with a radiometer, said radiometer being positioned laterally of said laser sighting device.

8. The apparatus of claim 4, in combination with a radiometer, said radiometer being positioned between said plurality of laser beams emitted by said laser sighting device.

9. The apparatus of claim 5 in combination with a radiometer, said radiometer being positioned on the central longitudinal axis of said secondary laser beams downstream of said diffraction means.

10. A method of measuring and displaying surface temperature

in a defined energy zone with a radiation pyrometer comprising:

A) pointing a heat responsive pyrometer in the direction of said energy zone on said surface; B) directing a plurality of at least three laser beams from a laser generator system to impinge a plurality of at least three visible spots on said zone to identify a closed figure which includes most of said zone where temperature is to be measured; and C) locating said pyrometer and said generator as a functional combination to direct said beams in essentially the direction of the pyrometer pointing towards said energy zone so that said spots outline said zone measured by said pyrometer.

11. A method of generating beams according to claim 10 in which at least one beam from said generator is split by a diffraction device.

12. Apparatus for measuring and displaying temperature across a surface in an energy zone comprising: a radiation pyrometer co-operating with a laser beam generator; means directing heat responsive elements of said pyrometer along a path between said surface and said pyrometer; and means directing a plurality of laser beams from said generator along an essentially parallel path to said path between so as to display a visible laser spot pattern around said zone from which said pyrometer measures temperature.

13. Apparatus according to claim 12 including means to provide plural laser beams from said generator.

14. Apparatus according to claim 13 in which said means to produce is a diffraction device.

15. A laser sighting device for outlining an energy zone to

be measured by a radiometer when measuring the temperature of a surface, said device including:

means projecting more than two laser beams toward said surface;

means causing said laser beams to outline the periphery of said energy zone.

16. A laser sighting device for identifying and defining an energy zone to be measured by a radiometer when measuring the temperature of a surface, said device including:

means to project at least one laser beam toward said surface;

and means rotating said projecting means so as to cause said beam to travel about the periphery of the energy zone on said surface so as to identify and define the energy zone.

17. A laser sighting device for visibly outlining an energy zone to be measured by a radiometer when measuring the temperature of a surface, said device generating more than two laser beams adapted to project towards said surface on different sides of said energy zone so as to outline substantially the entire periphery thereof.

18. A laser sighting device for identifying and defining the center and periphery of an energy zone to be measured by a radiometer when measuring the temperature of a surface, said device including:

means for projecting more than two laser beams towards said surface;

and means for causing said laser beams to identify and

define both the center and substantially the entire periphery of said energy zone.

19. A laser sighting device for identifying the center of an energy zone on a surface and for outline the periphery of said energy zone, said device adapted to be used in conjunction with a radiometer when measuring the temperature of said surface, said device including:

means for projecting at least one laser beam toward said surface to identify the center of said energy zone; and

means for projecting more than two other laser beams toward said surface to outline the periphery of said energy zone on said surface.

20. The laser sighting device of claim 19 wherein said means for projecting said other laser beams is caused to rotate said other laser beams to travel about and outline the periphery of said energy zone on said surface.

21. Apparatus for use in conjunction with a radiometer for visibly identifying an energy zone on a surface whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device for emitting laser beams against said surface and said beams being positioned to be divergent with respect to the energy zone to outline visibly the periphery of said zone.

22. Apparatus as claimed in claim 21 wherein said laser sighting device emits more than two laser beams against said surface.

23. Apparatus for use in conjunction with a radiometer for identifying the extent of an energy zone whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device co-operating with said radiometer and arranged to emit a laser beam toward said energy zone and mirror means modifying said laser beam and directing said modified beam towards the energy zone to illuminate a circular line about said energy zone.

24. Apparatus as claimed in claim 23 wherein said means for modifying and directing said laser beam are mechanical means.

25. Apparatus for use in conjunction with a radiometer for identifying the extent of an energy zone whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device co-operating with said radiometer and arranged to emit a circular beam along the axis of the radiometer towards the energy zone to form an illuminated ring at said energy zone defining the extent of the zone to be measured.

26. Apparatus for use in conjunction with a radiometer for identifying the extent of an energy zone whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device co-operating with said radiometer for emitting laser beams toward said energy zone to mark the edge and the center of an area of said zone which is to be measured.

27. Apparatus for use in conjunction with a radiometer for visibly outlining an energy zone on a surface whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device for emitting more than two laser beams

against said surface and means for positioning said laser beams about the energy zone to outline visibly the periphery of said energy zone.

28. Apparatus as claimed in claim 27 wherein said means for positioning said laser beams are arranged to outline visibly only the periphery of said energy zone.

29. Apparatus, as claimed in claim 28 wherein said means for positioning said laser beams comprises a mirror, and means for positioning said mirror for receiving and reflecting said laser beams against said surface to outline said energy zone.

30. A method for identifying the extent of a radiation zone on a region whose temperature is to be measured, using a radiometer, said method comprising the steps of:

providing a sighting device for use in conjunction with said radiometer, said device including means for generating a laser beam;

splitting said laser beam into more than two components;
and

directing said components toward said region to identify substantially the entire extent of said radiation zone.

31. A method for identifying the extent of a radiation zone on an area whose temperature is to be measured using a radiometer, said method comprising the steps of:

providing a sighting device for use in conjunction with said radiometer, said device including means for generating laser beam;

splitting said laser beam into more than two components,

and directing said components toward said area to identify the extent of said radiation zone.

32. A method of visibly outlining an energy zone on a surface whose temperature is to be measured using a radiometer, said method comprising the steps of:

providing a sighting device for use in conjunction with said radiometer, said device including means for generating a laser beam;

splitting said laser beam into more than two split laser lines; and

directing said laser lines towards said surface to outline visibly the periphery of said entire energy zone.

33. A method for identifying an energy zone whose temperature is to be measured using a radiometer, said method comprising the steps of:

providing a sighting device for use in conjunction with said radiometer, said device including means for generating laser beams;

splitting said laser beams into split laser lines;

directing said laser lines towards said zone; and

positioning said laser lines to identify the periphery of said entire zone.

34. A method for visibly outlining an energy zone on a surface whose temperature is to be measured using a radiometer, said method comprising the steps of:

providing a sighting device means for use in conjunction with said radiometer, said device including means for generating a

laser beam;

splitting said laser beam into more than two split laser lines;

directing said laser lines toward said surface, and positioning said laser lines to outline visibly the periphery of said zone.

35. The method of claim 34, wherein said laser lines identify the extent of said energy zone.

36. Apparatus for use in conjunction with a radiometer for identifying a radiation zone in an area whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device for use in conjunction with said radiometer, said laser sighting device including:

means for generating a laser beam;

means for splitting said laser beam into more than two components; and

means for positioning said components to identify the extent of said entire radiation zone.

37. Apparatus for use in conjunction with a radiometer for visibly outlining an energy zone on a surface whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device for use in conjunction with said radiometer, said laser sighting device including:

means for generating a laser beam;

means for splitting said laser beam into more than two split laser lines; and

means for directing said laser lines towards said

surface; and

means for positioning said laser lines to outline visibly the periphery of said energy zone.

38. Apparatus for use in conjunction with a radiometer for identifying the extent of an energy zone whose temperature is to be measured using said radiometer, said apparatus comprising a laser sighting device co-operating with said radiometer for emitting more than two laser beams toward said energy zone along separate paths; and means for adjusting said paths of said laser beams to outline the periphery of said zone.

39. Apparatus for measuring the intensity of detected radiation comprising:

a radiation detector having means for measuring the intensity of said detected radiation;

a laser sighting device for directing more than two laser beams along axes in the direction of the radiation to be detected to define the limits of the zone of radiation to be measured; and

means for integrating the detected radiation intensity measurement and the zone of radiation as defined by the laser beams.

40. A method for identifying an energy zone whose temperature is to be measured using a radiometer, said method comprising the steps of:

providing a laser sighting device;

causing said sighting device to emit more than two laser beams toward said surface along separate paths;

adjusting said paths of said laser beams to outline

visibly the periphery of said energy zone.

41. Apparatus for identifying an energy zone whose temperature is to be measured using a radiometer, said apparatus including:

a laser sighting device for emitting more than two laser beams toward said surface; and

means for adjusting said laser beams to outline visibly the periphery of said energy zone.

42. In apparatus for temperature measurement comprising:

a) a detector responsive to infrared radiation from an energy zone on a surface to be measured,

b) an optical system directing said radiation from said energy zone onto said detector,

c) and a sighting device for ascertaining the position and size of the energy zone on said surface to be measured, by visible laser light, the improvement in which

d) the sighting device includes a beam splitter element for production of more than two laser beams outlining visibly the periphery of substantially said entire zone and for spreading the laser light intensity.

43. In a laser sighting device for visibly outlining an energy zone to be measured by a radiometer when measuring the temperature of a surface, including means projecting more than two laser beams toward said surface, the improvement comprising means causing said laser beams to strike the periphery of said zone and visibly outline said entire zone.

44. A device according to claim 43 including means projecting at least one laser beam to identify the center of said zone.

45. A temperature measurement device comprising a detector for receiving heat radiation from a measuring zone of the object under examination, and a direction finder sighting device including a laser generator providing a laser beam serving as a light source, said sighting device further including a holographic beam splitter providing sub-divisional laser beams to strike the object and show thereon at least three illuminated areas at the periphery of and enclosing and defining the measuring zone.

46. A method for visibly outline an energy zone on a surface where temperature is to be measured using a radiometer, said method comprising the steps of:

providing a laser sighting device with said radiometer and a laser beam splitting device;

emitting more than two laser beams from said device striking against said surface about the periphery of about 90% of said energy zone;

projecting, from said laser beam splitting device, more than two spots at the circumference of said zone positioned so as to encompass, configure and outline said circumference and so visibly outlining said zone.

47. Apparatus for use in conjunction with a radiometer for visibly outlining an energy zone on a surface where temperature is to be measured using said radiometer, said apparatus comprising:

a laser sighting device co-operating with said radiometer, for emitting more than two laser beams against said surface;

and means positioning said laser beams about said energy zone to outline visibly the periphery of said zone.

48. The apparatus of claim 47, wherein said means for positioning said laser beams comprises a splitter which is adapted to split said laser beams into a plurality of beams which are then directed against said surface to define the energy zone.